



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,707	09/26/2003	Timothy J. Van Hook	00100.01.0022	1126
29153 7590 03/26/2010 ADVANCED MICRO DEVICES, INC. C/O VEDDER PRICE P.C. 222 N.LASALLE STREET CHICAGO, IL 60601				
EXAMINER				
MOTSINGER, SEANT				
ART UNIT		PAPER NUMBER		
2624				
MAIL DATE		DELIVERY MODE		
03/26/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/672,707

Applicant(s)

VAN HOOK ET AL.

Examiner

SEAN MOTSINGER

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 08 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-61 and 63-99 is/are pending in the application.
- 4a) Of the above claim(s) 14-33, 36-54 and 69-88 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-6, 8-13, 34-35, 55-61, 63-68 and 89-97 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 2/25/2010
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Response To Applicants Arguments/Amendments

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/8/2010 has been entered.

Regarding applicants arguments on page 29 the examiner disagrees with applicants characterization of the Jouppi reference; applicant "jouppi utilizes spares super sampling sub samples s1-s4 namely four subsamples are used for a pixel broke up into 16 framgments" and "is not a tile based compression sutibility evaluation nor partial compression of tiles as claimed". The examiner disagrees with these statements. Although Jouppi describes his invention with respect to a pixel which could in itself correspond to a tile comprising one pixel. Jouppi sas that this approach and be modified using 2X2 group of pixels (column 6 lines 1-10) with 4 samples per pixel (as admitted by applicant) and compresses it. The examiner notes that applicant takes a 2X2 group of pixels with 4 samples per pixel and compresses as show for example in figure 3. Applicants argument that a 2X2 group of pixels with 4 samples per pixel does not constitute a tile is merely semantics.

The 2X2 tile of Jouppi is compressed by dynamically allocating memory per tile (column 6 lines 10-20)

Applicants argues that Jouppi is silent as to determining whether a tiles is suitable for full compression partial compress or no compress. However Jouppi dynamically allocates memory for fragment triples based on the number of fragments (column 6 lines 12-17) and the number of fragments correspond to the number of primitives (see column 3 line\ 60—column 4 line 5). Full compression would correspond to only one fragment and one fragment triples. Having two fragment triples would provide less compression but still some compression and therefore could be considered partial compression. Having 4 fragment triples would result in no compression (see column 30-35 amount of storage approaches or exceeds the amount of storage for typical spares sub sampling)

Regarding applicants arguments with respect to claims 8 and 91 applicant argues that "no discussion of a tiles based compression evaluation utilizing a number of primitives covering a tile to determine weather to use partial compression of other level of compression as claimed" The examiner disagree Jouppi dynamically allocates memory for fragment triples based on the number of fragments (column 6 lines 12-17) and the number of fragments correspond to the number of primitives (see column 3 line\60—column 4 line 5) Full compression would correspond to only one fragment being visible in the pixel and one fragment triples being dynamically allocated. Having

two fragment triples being dynamically allocated would provide less compression but still some compression and therefore could be considered partial compression. Having too many fragment triples dynamically allocated could result in no compression (see column 30-35 amount of storage approaches or exceeds the amount of storage for typical spares sub sampling). A primitive is a whole primitive a fragment is just the piece of the primitive which covers the pixel or group of pixels.

Rejections Under 35 U.S.C. 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 8-13 34-35, 55-61, 63-68, 89-99 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims recite various combination of "partial compression", "full compression" and just "compression" its not clear which or what compression is being refereed to when applicant recites just"compression."

Rejections Under 35 U.S.C. 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims, 55-61, 63-65, 67-68, 90 and 92 are rejected under 35 U.S.C. 101 because these claims claim a computer program product comprising a computer readable medium. This computer product could reasonable be construed to cover a transient signal. The broadest reasonable interpretation of a claim drawn to a computer readable medium (also called machine readable medium and other such variations) typically covers forms of non-transitory tangible media and transitory propagating signals *per se* in view of the ordinary and customary meaning of computer readable media, particularly when the specification is silent. See MPEP 2111.01. When the broadest reasonable interpretation of a claim covers a signal *per se*, the claim must be rejected under 35 U.S.C. 101 as covering non-statutory subject matter.

The USPTO recognizes that applicants may have claims directed to computer readable media that cover signals *per se*, which the USPTO must reject under 35 U.S.C. 101 as covering both non-statutory subject matter and statutory subject matter. The USPTO suggests the following approach. A claim drawn to such a computer readable medium that covers both transitory and non-transitory embodiments may be amended to narrow the claim to cover only statutory embodiments to avoid a rejection under 35 U.S.C. 101 by adding the limitation "non-transitory" to the claim. Such an amendment would typically not raise the issue of new matter, even when the specification is silent because the broadest reasonable interpretation relies on the ordinary and customary meaning that includes signals *per se*.

Rejections Under 35 U.S.C. 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 8-10,13, 34-35, 55 89, 91 and 94 are rejected under 35 U.S.C. 102(b) as being anticipated by Jouppi et al US 6,128,000.

Re claim 1 Joupii discloses a method of data compression comprising: grouping a plurality of pixel data into a plurality of tiles (each of the plurality of pixels could be considered its own tile or a group of pixels (tile) could share a particular pixel memory column 6 lines 1-10); prior to compression (note memory must be dynamically allocated before data can be stored into it and the compression completed) evaluating said tiles for compression suitability to determine if said tiles is to be fully compress partially compressed or uncompressed (dynamically allocate memory column 6 lines 15-20 note memory for "fragment triples" is dynamically allocated based on how many fragments cover the pixel (or group of pixels) designation of full compression corresponds to the dynamic allocation of only 1 fragment triple, partial compression corresponds to the dynamic allocation of 2 fragment triples and uncompressed corresponds to the dynamic

Art Unit: 2624

allocation of 4 fragment triples), wherein said compression recognizes duplicate data (column 5 lines 15-20) and reduces amount of duplicate data stored within said tiles (column 5 lines 15-20); compressing said tiles if said tiles are deemed suitable for said compression (dynamically allocate memory column 6 lines 15-20 note if 4 fragment tipples are stored for each pixel which does not compressed in relation to sparse sub sampling column 8 lines 35-38 if less are needed memory is saved) wherein said evaluation comprises determining that a tile is suitable for partial compression when a pixel is covered by more then one triangle primitive (dynamically allocate memory column 6 lines 15-20 partial compression corresponds to be 2 fragment tipples being dynamically allocated note the number of fragment triples corresponds to the number of fragments (i.e. number of triangle primitives see column 3 line 60 through column 4 line 5)); and designating said tile for partial compression if it is deemed to be suitable (dynamically allocate memory column 6 lines 15-20 partial compression corresponds to 2 fragment tipples being dynamically allocated) and wherein partial compression comprises employing at least two color designations for a same tile to compress the data (column 5 lines 45-55 note each fragment triple stores a color designation column 5 lines 45-50); partially compressing the tile using a single bit to represent each of the at least two color designations (figure 6A-B column 6 lines 45-57 note a single bit is used to point to one of two "fragment triples")

Re claim 2 Jouppi discloses wherein said pixel data is color information (column 5 lines 40-50)

Re claim 3 Jouppi discloses determining whether a tile is suitable for full compression; designating said tile for full compression if it is deemed to be suitable (dynamically allocate memory column 6 lines 15-20 full compression read to be 1 fragment tiple being dynamically allocated).

Re claim 4 Jouppi discloses determining whether said tile is wholly covered by a triangle primitive (column 3 lines 60-67, column 4 lines 1-10 note pixel (or tile) will have one fragment if it is wholly covered by a triangle primitive).

Re claim 5 Jouppi discloses wherein said step of compressing further comprises: storing a single color entry for each pixel in said tile (dynamically allocate memory column 6 lines 15-20 note if only one fragment is visible in the pixel, only one fragment will be stored).

Re claim 8 Jouppi discloses wherein said step of determining further comprises: determining whether said tile is covered by less than two triangle primitives (note partial compression corresponds to the dynamic allocation of memory for two fragments, fragments correspond to the number of column 3 lines 60-67, column 4 lines 1-10 note the number of fragments corresponds to the number of primitives covering the pixle or tile,).

Re claim 9 Jouppi discloses wherein said step of compressing further comprises: assigning an order to triangle primitives covering said tile (figure 6 fragment triples (corresponding to a fragment) are represented by 0 or 1); determining the color type of each sample of said tile (fragment triple columns 6 lines 25-40); creating a compressed format of color entries out of said pixel data (fragment triple columns 6 lines 25-40);; creating a pointer to said compressed format (column 6 lines 35-55).

Re claim 10 Jouppi discloses wherein said pointer comprises a bit encoding associated with each sample in said tile, wherein each bit represents an index to entries in said compressed format column 6 lines 50-65).

Re claim 13 Jouppi discloses wherein said tiles are 2.times.2 in size (column 6 lines 1-5).

Re claims 34, 35 and 55, these claims are similar to claims 1, 2 and 13 respectively only they claim a graphics processing apparatus for performing these methods. Jouppi also discloses with a graphics processing apparatus see figure 1.

Re claim 89 and 91 these claims substantially correspond to claims correspond to claims 4 and 8 respectively only with out the limitation on the evaluating step evaluating "prior to compression...to determine if said tile is to be fully compressed partially compressed or uncompressed limitation and are likewise rejected.

Re claim 94 Jouppi discloses wherein partial compression comprises employing pointers to designation samples that correspond to an original color designation and a replacement color designation (column 6 lines 50-65 also see figure 4).

Re claim 95 Jouppi discloses wherein the method is carried out by a graphics processor
(column 6 lines 15-16)

Re claim 96 Jouppi discloses wherein the method is carried out by a graphics processor
(column 6 lines 15-16)

Re claim 97 Jouppi discloses wherein the method is carried out by a graphics processor
(column 6 lines 15-16)

Rejections Under 35 U.S.C. 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6, 12, 55-61, 63-65, 67-68, 90, 92 and 93 are rejected under 35 U.S.C. 103(a) as being rendered obvious by Jouppi et al in view of Molnar.

Re claims 56-60, 63-65, 68, 90 and 92 These claims are substantially the same as claims 1-5, 8-10, 13, 89 and 91 respectively only they are directed to a computer readable medium storing a program for performing these methods. Jouppi does not expressly discuss a computer readable medium. Molnar discloses performing his method on a computer with software see figure 1 and column 4 lines 35-45. embodying a computer readable medium to perform the compression method of Jouppi as done Molnar is within the ordinary skill of the art and the result would be predictable. Therefore it would have been obvious to combine Jouppi and Molnar.

Re claim 6 Jouppi discloses all of the elements of claim 3 and wherein said full compression compresses said pixel data into one color values per pixel (see claim 5). Joppi's color values are 5 bytes see column 5 lines 45-50. Joppie could easily implemented to use one 32 bit word per color value (with one color values per pixel) as in Molnar 9 lines 50-55, and the results (32 bits per color) would be predictable. Therefore it would have been obvious to combine Jouppi and Molnar

Re claim 12 Jouppi discloses all of the elements of claim 1 and wherein said partial compression compresses said pixel data into two color values per pixel. Joppis color values are 5 bytes see column 5 lines 45-50. Joppie could easily implemented to use one 32 bit word per color value (with two color values per pixel) as in Molnar 9 lines 50-55, and the results (32 bits per color) would be predictable. Therefore it would have been obvious to combine Jouppi and Molnar

Re claim 61 Jouppi discloses all of the elements of claim 58 and wherein said full compression compresses said pixel data into one color values per pixel (see claim 60).. Joppi's color values are 5 bytes see column 5 lines 45-50. Joppie could easily implemented to use one 32 bit word per color value (with one color values per pixel) as in Molnar 9 lines 50-55, and the results (32 bits per color) would be predictable. Therefore it would have been obvious to combine Jouppi and Molnar

Re claim 67 Jouppi discloses all of the elements of claim 56 and wherein said partial compression compresses said pixel data into two color values per pixel. Joppi's color values are 5 bytes see column 5 lines 45-50. Joppie could easily implemented to use one 32 bit word per color value (with two color values per pixel) as in Molnar 9 lines 50-

55, and the results (32 bits per color) would be predictable. Therefore it would have been obvious to combine Jouppi and Molnar

Re claim 93 Jouppi discloses a method comprising: grouping a plurality of pixel data into a plurality of tiles (each of the plurality of pixels could be considered its own tile or a group of pixels (tile) could share a particular pixel memory column 6 lines 1-10); evaluating said tiles for compression suitability (dynamically allocate memory column 6 lines 15-20 note memory for "fragment triples" is dynamically allocated based on how many fragments cover the pixel column 6 lines 10-20) wherein said compression recognizes duplicate data (column 5 lines 15-20) and reduces amount of duplicate data stored within said tiles (column 5 lines 15-20); compressing said tiles if said tiles are deemed suitable for said compression (storing the fragment data in the dynamically allocated memory column 6 lines 15-20 note if 4 fragment triples are stored for each pixel which does not compressed in relation to sparse sub sampling column 8 lines 35-38 if less are needed memory is saved)

wherein said evaluation comprises determining that a tile is suitable for partial compression (dynamically allocate memory column 6 lines 15-20 partial compression corresponds to be 2 fragment triples being dynamically allocated note the number of fragment triples corresponds to the number of fragments (i.e. number of triangle primitives see column 3 line 60 through column 4 line 5)); and designating said tile for partial compression if it is deemed to be suitable (dynamically allocate memory column 6 lines 15-20 partial compression corresponds to 2 fragment triples being dynamically

allocated) wherein said step of compressing further comprises: assigning an order to triangle primitives covering said tile (figure 6 fragment triples (corresponding to a fragment) are represented by 0 or 1); determining the color type of each sample of said tile (fragment triple columns 6 lines 25-40); creating a compressed format of color entries out of said pixel data (fragment triple columns 6 lines 25-40);; creating a pointer to said compressed format (column 6 lines 35-55). Jouppe does not expressly discuss a computer readable medium. Molnar discloses performing his method on a computer with software see figure 1 and column 4 lines 35-45. embodying a computer readable medium to perform the compression method of Jouppe as done Molnar is within the ordinary skill of the art and the result would be predictable. Therefore it would have been obvious to combine Jouppe and Molnar.

Allowable Subject Matter

Claims 98 and 99 would be allowable if the rejections under 35 U.S.C. 112 were overcome . Claims 11 and 66 are objected to as being dependent from a rejected base claim but would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims and and rejections under 35 U.S.C. 112 are overcome. Claims 11 and 66 contain the subject matter wherein said pointer comprises a bit encoding associated with each sample in said tile, wherein each bit represents an index

to entries in said compressed format. Which is not found in the prior art of record, therefore these claims contain allowable subject matter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN MOTSINGER whose telephone number is (571)270-1237. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bhavesh M Mehta/
Supervisory Patent Examiner, Art Unit 2624

Application/Control Number: 10/672,707

Page 16

Art Unit: 2624

Motsinger

3/24/2010